AT-P1200E1000TP

Table of contants

1 Introduction

1.1 What is FSO?

FSO is free space optics provides point-point broadband communications using Laser Light as the transmission medium.

FSO is a state of art data communication method which is based on a very old communication solution. Ancient Chinese developed a protection system against the Mongol tribes, building watchtowers within the line of site to other towers. And as soon as the towers saw some hostile sign on the horizon they use they shield to reflect the sun to the remote towers. In this way the area could be prepared against the attack in a very short period of time.
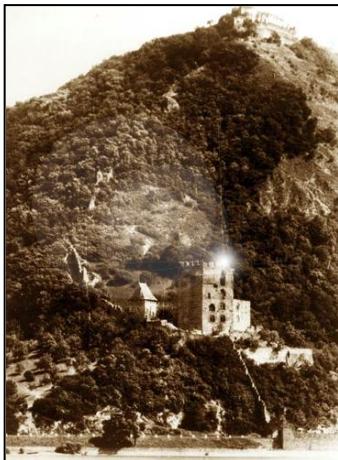
In the ancient times for this communication use the mirror as a transmitter and the sunlight was the light source, and the receiver was the remote guard's eye. This basic signalling method was developed later into up communication device which used „line coding". This allowed the guards to tell the number of enemy, or the direction they are coming from.

Current **FSO** systems use a laser-diode as a light source, and a receptor diode (photo diode) to receive the signals coming from the laser diode from the transmitter side. But the basic elements are still the same: line of site between the communication nodes, and individual line coding. It is all about performance. **GeoDesy FSO** offers **FSO** systems with the highest power budget available on the market.

1.2 Why is it important?

Because of in the ancient Chinese times, the rain, the fog, or even the cloudy weather, could impact the operation of the whole system.

In the **FSO** units, comprising light source and receiver the cloud problem was solved, but development conditions still can impair performance. To go throw the rain, the fog, or snow you need more and more power to be seen from the remote side. Achievable power levels are limited by a number of factors including eye safety.

In this way there is no other choice to see more than „training the eye". Making the receiver more and more sensitive to sense delight emitted from the remote side. **GeoDesy FSO** offers high transmit power and also

very hard receiver sensitivity. These two factors combined to provide one of the best performing **FSO** systems on the market today.

To meet the demands for every higher bandwidth, **GeoDesy FSO** continues to invest heavily in research and development with the newest product line which offers Gigabit speeds being launched.

This manual describes the **GeoDesy FSO** series of free space laser transmission system.
The **GeoDesy FSO Next** product range offers cost effective reliable free space laser transmission for two Mbps up to 1000 Mbps data to the air, where a clean line of site is available. It delivers the most effective point-to-point connection between computer networks or telephone exchanges.
No need for installing cables, no rental costs, no licensing requirements.

Ideal for urban areas or city centres, where the use of these lines are expensive. Suitable for factories or industrial environments where high noise level can interfere with the transmitted data. The best choice to make a connection across rivers and other natural or artificial obstacles, where cable is not available.

The transmission technique used in the **GeoDesy FSO** devices provides transparent and wire-speed data transfer with virtually zero latency. Because they use infrared light as the transmission medium, **GeoDesy FSO** system do not require frequency licenses and the transmission is not effected by electro-magnetic or radio-frequency interference. Basically the **GeoDesy FSO** link can be considered as a virtual fibre in the air, which ends in real fibre optic cable at both ends.
Our product is built using high quality components for operation in even the most adverse conditions.

Metal housing gives robust, waterproof environment for the electronics.
The shield protects the device from direct sunlight and provides extra air isolation.
The **GeoDesy FSO X** systems comprise two laser-heads
one at each end. The interface connections are housed in the outdoor unit together with the PSU of the system.

Best practises were employed in cost engineering throughout the development of **GeoDesy FSO**.

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1.3 Optical Free-space Transmission

The principle used in free space laser transmission is very similar to the one is used for fibre optic transmission. The difference is while fibre optic devices use electronics and optics optimized for transmission to the air. Also one can observe to the similarity in the transmission properties. No galvanic contact, no ground-loops, no need for surge protection, noise immunity, long distances, high bandwidth.

What makes it unique – and difficult to design – is that it does not require any transmission medium like fibre or copper, but it has to cope with the dynamically changing parameters. For instance while the attenuation of an optical fibre is constant, the attenuation of the atmosphere between the laser units can change dramatically (depending on the weather conditions).
The laser-heads are usually placed on top of building, where the clean line of site is guaranteed and the beam cannot be interrupted.

In the head the incoming signal is amplified, encoded, and then drives the laser-diode. The transmitter optics assures the proper beam shape and controls the beam divergence. The receive optics perceives and directs the transmitter signal to the photo diode. The diode converts it back into electrical, than it is decoded, amplified and converted.

There are several things that can influence the quality of transmission. We can classify those factors into three main groups.
System conditions - transmitting power, transmitter's wavelength, beam divergence, receiver optics diameter, receiver sensitivity, parameters of optical system and casing. These parameters determine the system's characteristic at a certain distance and are controlled by system design and factory set up.

Weather conditions - molecular absorption, particle scattering and turbulence. These elements have great effect on the operational conditions of the system. We do not have very much influence on them; proper product selection can eliminate the undesirable effects.

Environmental conditions - building movements, direct sunlight, refractive surfaces. These are also key factors related to the installation sites and can be controlled by appropriate site survey and system installation

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1.4 Typical applications

Most typically the **GeoDesy FSO Next** product are is used to interconnect LAN-s. The system is protocol transparent, thus other applications also can be taken into consideration. Appropriate interface converters are needed and system bandwidth must be matched for that.

Here we collected some circumstances, where the deployment of the **GeoDesy FSO** is the most adequate as a cost effective solution.

Those are:

Areas with natural or artificial obstacles

Where cable is actually not an alternative, like across rivers or railways or in rugged terrain.

Urban areas

Where only leased lines are available with limited speed, and high rental cost. With GeoDesy FSO links you can establish on line LAN-to-LAN connections.

Industrial areas

Where you have noisy environment with high EMI or RFI. Factory buildings, airport objects can be connected through laser link.

ISP connections

Where high bandwidth is required. ISP's can offer high-speed links to their customers or trunks can be established between ISP's instead of expensive leased lines.

Corporate LAN

ISP

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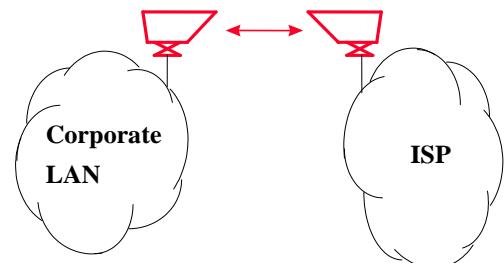
2 Interfaces for the Giga Next Series

2.1 1000Mbps TP interface

The **GeoDesy FSO** series products are designed to provide easy-to-use and cost-effective solution for interconnecting Local Area Networks. By utilizing standard Category 5e cable and using standard IEEE802.3af interface the deployment of the system is easier than ever before. The transparent and wire speed data transfer together with virtually zero latency assures the easy integration of the system in all environments.
The systems should be considered as repeaters in the network. So the installation distance between the head and the network device is 50m.

The systems connecting to the network with two RJ 45 cable which provides the power required for operation and the data.The power consumption suits to the standards described in the standard. Also provides fast and easy connection for the management system for more details please see the chapters below. The system is certified **Class 1M product**, this way 100% eye safe.

2.2 1000 Mbps FO interface

The GeoDesy FSO system is ready to be upgraded with a Single or Multi mode SC fiber interface with SX or LX option.

The power is provided via the same cable as in the case of the TP interface systems.

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3 Sites of installation

3.1 Key factors of operation

There are four key issues that the site survey has to shed light on. Proper system operation cannot be guaranteed without satisfying all of the four requirements.

Clear line of sight - The entire optical path between the two ends must be free of any obstacles. It not only means that one has to see the other side, but other possible sources of disturbance should also be taken into consideration. For example there might be turbulence above the roofs and other constructions, and this can cause fraction or scattering of the beam or snow accumulation on roofs too close to the beam can influence or even interrupt communication.

Solid mount surface - is the key for long-term operation. Since the diameter of the beam is limited, it is extremely important to mount the unit on a stable structure with the possible smallest movement. This way the receiver of the remote unit cannot get out of the beam due to the movement of the opposite head.

East-West orientation - although the receiver optics are equipped with optical filters to protect the receiver diode from the effect of undesired light sources, direct sunshine can cause saturation of the diode. This prevents the system from working properly for several minutes a day at certain times of the year. In most cases this effect can be avoided by careful selection of the mounting spot.

In order to comply with the requirements of the successful installation - including the discussed four key factors and other criteria - the following matters should be taken into consideration.

3.2 Preferred installation sites

All buildings and constructions have a certain movement of their own. It's determined by the structure and material of the building. Metal structures can shift or twist due to temperature changes. Wooden construction can expand or shrink with any changes in humidity. Give preference to concrete or brick buildings. On the other hand high structures like towers, skyscrapers or poles are always subject to movement. Mount the support frame to walls of the building or near corners, as they are the most stable spots. Use appropriate consoles for wall mounting. If a stand is used on the top of building, secure it directly to the ceiling or to the concrete cornice wherever is possible. Do not fix stands to insulating materials as they can slowly sink under the weight of the unit and with temperature changes. Big chimneys and smokestacks may look stable, but as their inner temperature varies they can also move. Vibration caused by heavy traffic, trains and elevators etc. may slowly move the system out of its specified direction. Another important consideration is to provide enough space for alignment and to have the potential for future maintenance. Consider that the support frame is usually heavy, so the selected spot should be easily accessible.

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| Preferred installation sites	Pay attention to	Avoid (*)
Concrete wall	Behind window	Soft materials
Brick wall	Old constructs	Chimneys
	Microwave towers	Wooden constructs
		Metal masts or Frames
		Hidden heat isolations, like Styrofoam

(*)
In cases where installations are listed under "AVOID" cannot be avoided than special mounting accessories to be designed and special installations must be used.

It is not only the building that has to be solid, but the support structure too. Antenna poles and security camera holders are not suitable for the **GeoDesy FSO** units.

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3.3 Distance measurement

Because the units were designed, and calibrated for certain distance operations the higher distance will decrease the availability. GeoDesy FSO pre-calibrates and pre-tests every unit shipped to the customer. To ensure that the unit you are about to buy fits to the needs, the first step is to measure the distance. The best way to measure it is by GPS (Global Positioning System), these units are accurate enough to determine the distance between two points. For more details please refer to the GPS manufacturer handbook. Also there are several other ways to measure the distance. If you know the exact address you can use mapping software like MapPoint or Auto route.

3.4 Direct sunshine

To prevent the sun shining directly into the receiver optics, first one has to determine the orientation of the link. Try to avoid East-West orientation wherever it is possible. Examine both sides of the link at sunset and sunrise and find a position where the sun cannot get behind any of the heads. Be aware that the path of the sun is changing throughout the year.

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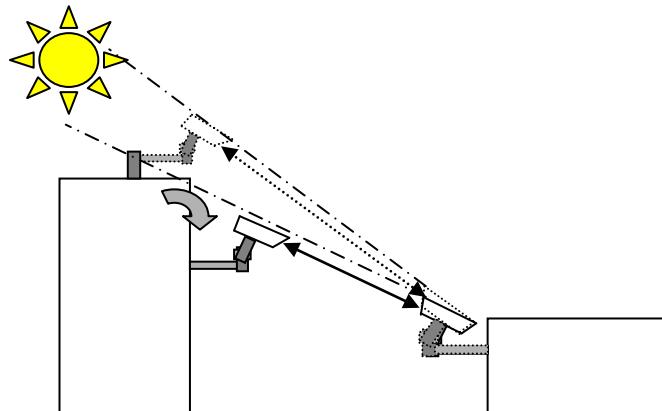
4 Eye safety

There are no two installation spots of the same kind, the buildings or structures, the available space and the accessibility of the place will be different in each case. Nevertheless, as a general rule it is very important to select the installation site so that nobody can look directly into the transmitter. For this reason place the head either so high (on the side wall of the building) or so close to the edge of the building (on a parapet on the rooftop) that no person can approach it accidentally and can get into the beam path. Set up barriers if necessary and put warning signs at prominent places.

The laser heads are provided with all labels and hazard warnings required by the laser standard. There are warning labels on both the left and right side of the protective cover next to the optical window and there is a warning and an informative label on the rear side of the laser head.

**INVISIBLE LASER RADIATION
DO NOT VIEW DIRECTLY WITH
OPTICAL INSTRUMENTS
CLASS 1M LASER PRODUCT**
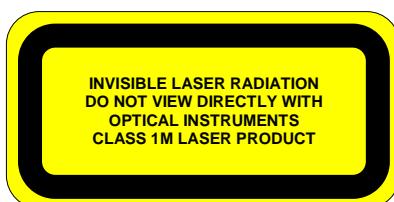
CE

| Type | : | AT-1200E1000 |
| S/N | : | LBH-«s/n» |

Input Power	:	-48VDC IEEE 802.3af compilant
Laser	:	1M
Wavelength	:	785nm

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5 The mounting bracket

In the following chapter you will find detailed description of the bracket fastenings.

5.1 Mounting brackets for the AT Series

GeoDesy FSO provides the mounting bracket and all the necessary components for **AT** series units. A simple fixing technique of this bracket can be seen on the following figure, required tools are as follows:
- drilling machine
- 12 mm wrench
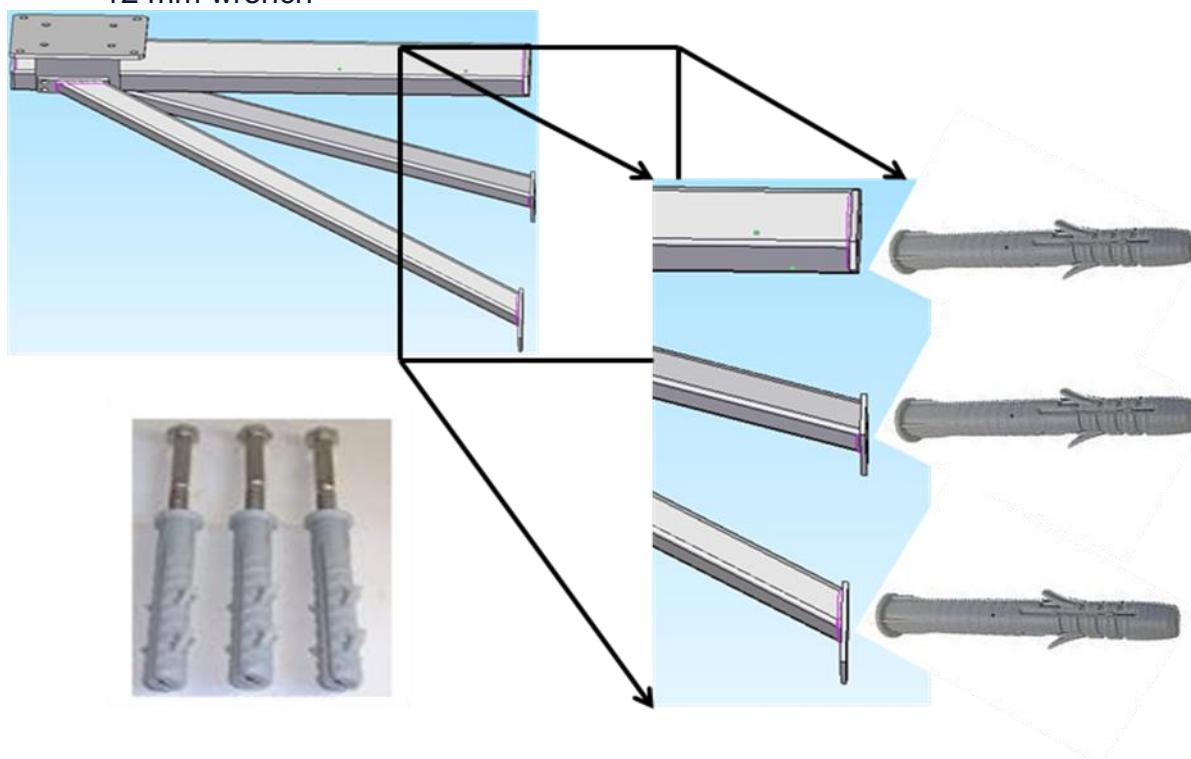
Installation steps:
- Place the bracket on the wall
- Mark the wall with a permanent marker
- Use your 12mm wall drill to drill all of the holes into the wall
- Clean the holes
- Place the wall-plugs into the holes (please note that some times you need to use hammer to put the wall-plugs into the hole, if you have to please be careful not to break the wall-plug)
- Place the bracket to the wall an line it up to the holes
- Put the screws into the wall-plug through the hole on the leg of the bracket (please see the figure above)
- Tighten up the screws

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Packet list for the bracket:
4pcs 8x110 screw for bracket fixing
4pcs 12x100 plastic wall-plug for bracket fixing
4pcs 8ϕ washer
4pcs 8ϕ spring washer
4pcs 8x16 hex head screw
4pcs 8x22hex head screw
2pcs RJ45 plug
1pcs 6x8 cross-head screws
1pcs 8ϕ seaqling washer
2pcs PG11cable gland blanking plag
1pcs short M6 screw

Mounting Hole Patterns

BRACKET

Alignment unit

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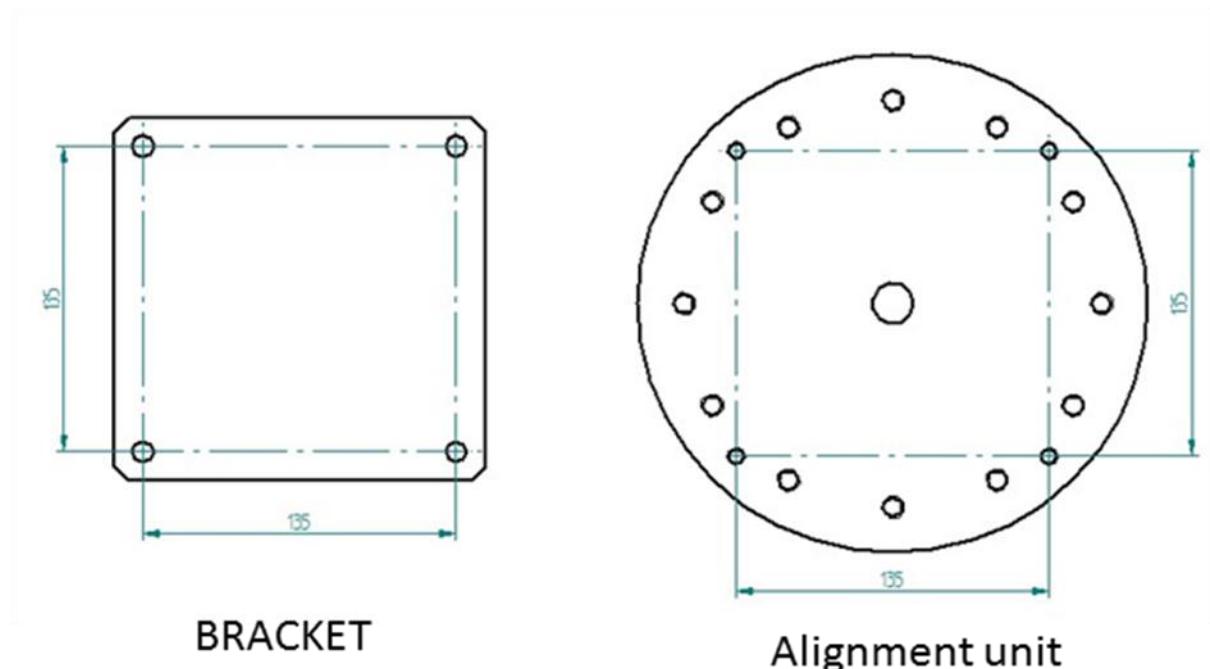
6   System connection

Before turning the system on check and read chapter 6.3 very carefully.

6.1 Connection Layout

Network Uplink   **FSO (reserved)**

FSO head
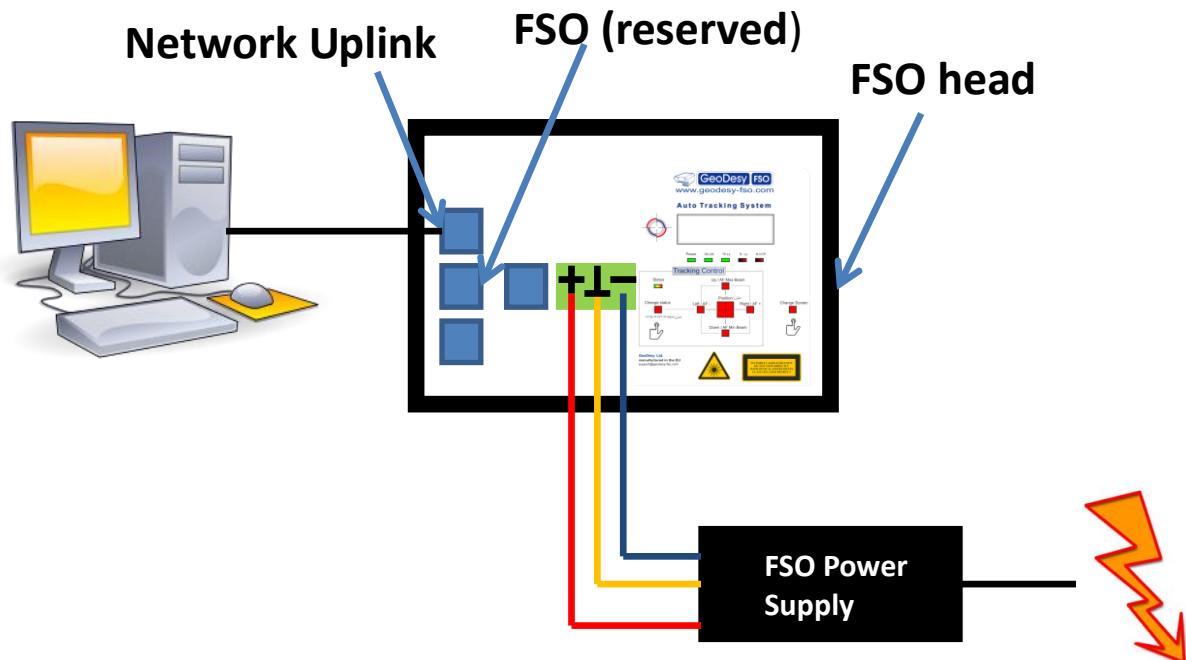
6.2 Power Supply connection and the laserhead

**Important: Please only solder UV proof 2wire cooper cable into its place as in below photos.**
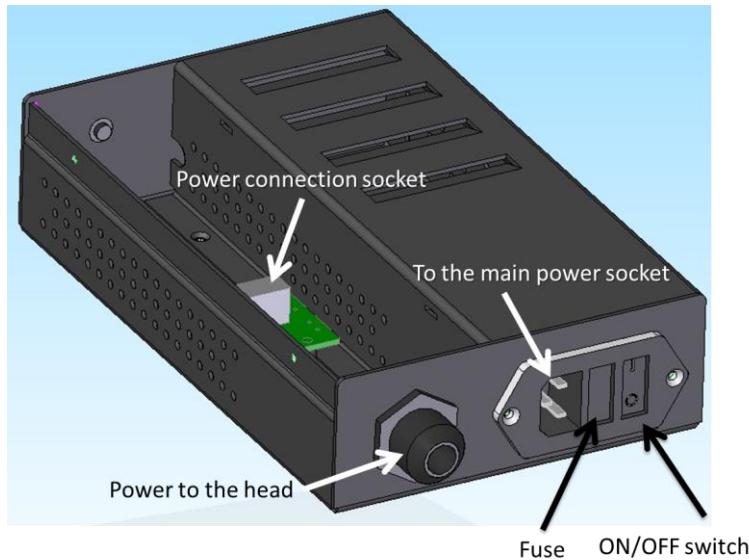
The power supply shall only be used indoors.

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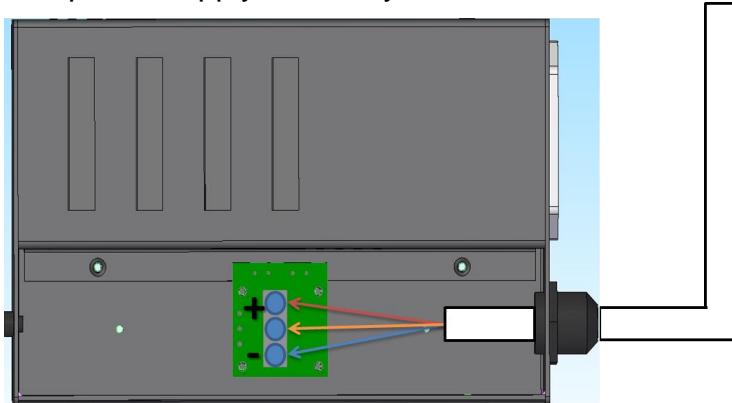
6.3 Transport fixing removal

Before turning ON the system, Please do the following.

1. Cut the cable tie below the laser head and pull it out of the laser head.
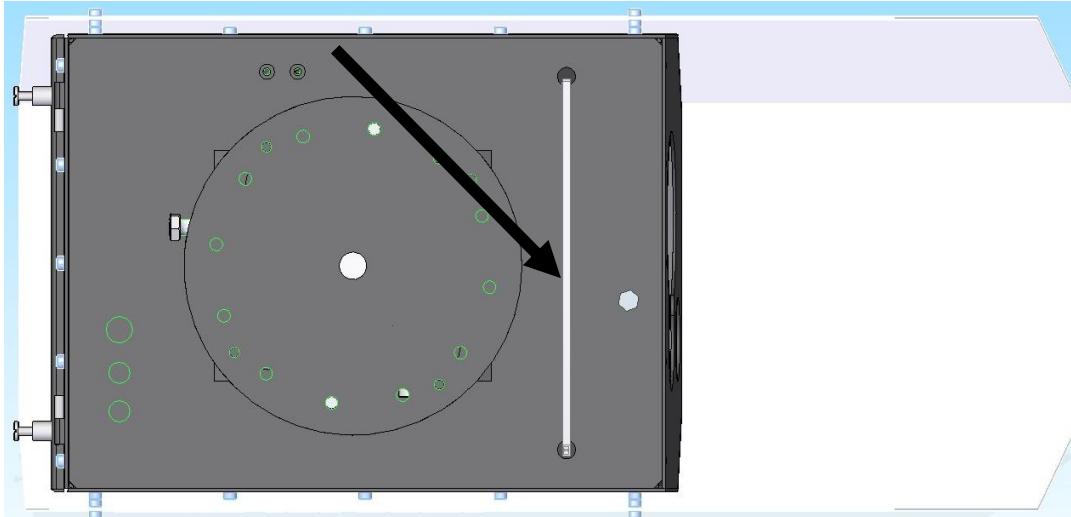
2. Unscrew the long M6 screw below the laser head.
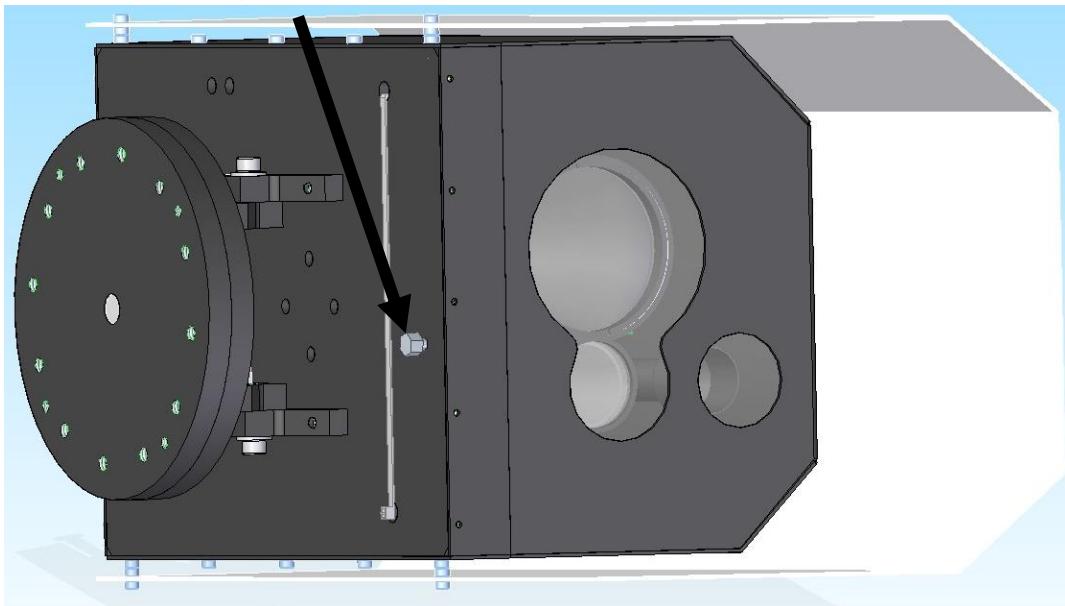
3. Cover the hole where the long M6 screw was using the short M6 screw (this is packed in the bag of screws of brackets) and also cover the two holes (where the cable tie was) by screwing the 2pcs cable gland blanking plug (also packed in the bag of screws of brackets).

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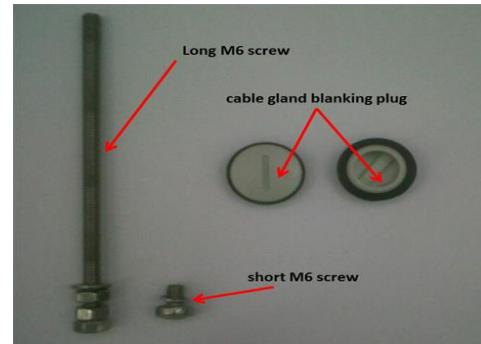
7 System installation

7.1 On the table test

Warning! Do not look either into the transmitter or the receiver optics because at this distance even the reflected laser beam *can* be dangerous to your eyes. Operating the system on much shorter distance than presumed originally can cause saturation or even permanent damage to the receiver. Always use optical attenuators for this kind of test.

The on-the-table test needs careful planning and careful use during the test period. The units should be placed at about 2 m distance from each other with optical windows facing one another. Put an appropriate optical attenuator (Attenuating foil or cardboard with several small holes) between the heads. Make all the necessary connection as described below to connect your network equipment (computer or protocol analyzer) to the heads and power up the units. Turn ON the Power Adapter and check if the power LED is ON on the head.

You should be able to align the units without any tool and get full received level on the signal strength LED's. Make sure that the "Saturation"(**OV**) indicator is OFF. Adjust your attenuators if necessary to avoid saturation of the receivers.

Please note that at this short distance, specially the longer distance links can reflect to the remote site or even to the same head. If you experience full receiving level, with no traffic throughput, in that case try to move the heads slightly units out of the reflection zone.

Please also take in consideration that the laser beam is concentrated and in such a short distance can harm your eyes, every time you test the units on short distance, do it with extra care. Never look into the sighting device if the remote laser is turned on. We strongly suggest to double check the power connection before you turn on the device. Handle the power connection with extra care. Safety first.

After obtaining the desired received level, check the data connection between devices. Using computers or appropriate testing devices.

On the table tests are perfect for troubleshooting (If there is a transmission problem, check the status of the connecting devices (e.g. Link signal or cable polarity) and cables.) in a controlled area. If you experience some problems during the test, please try to test the connected equipments with a direct connection.

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7.1.1 Alignment of the **AT-1200E1000TP**

The first step after the unit was placed to the bracket, and the units facing each other.

On the back of the receiver you can find the LEDs and LCD screen for the local received level and the remote received level.
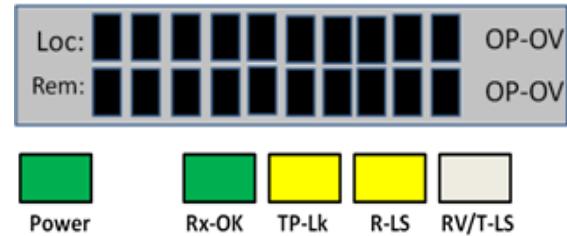
This help will be very useful because as soon as you have received – which is very easy to achieve – you can see the effect of your local sides movement to the other side. For further information please check the *Meanings of the LCDs* chapter.

7.2 LCD screens
Power: The head is powered up.
RX-OK: Received beam is good for communication.
TP Lk: Copper link between the head and the Network equipment.
R-LS: The recived signal form the remote end is modulated.
RV/T-LS: Remote end is visible for the management system and there is TP connected to remote end – same as TP-Lk but displays it on the remote end.
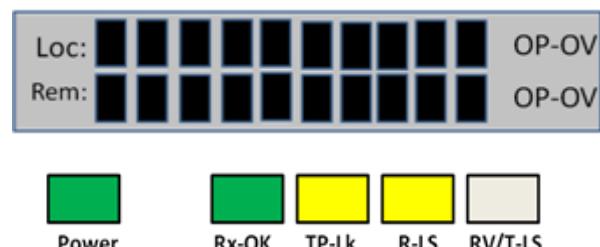
Please press the button on the backside of the unit to scroll between the screens!

1.screen
Loc (local level): Light received from the remote end.
Rem (remote level): Remote Sites Received level.
Op: optimal
Ov: overload
REM:?FSO Currently on FSO channel searching the Remote side.
REM:?Backup Currently on Backup channel searching the Remote side.
REM:?FSO or Backup Auto Software desides on what to search for.

2.screen
HeadSN: The laser head serial number
0000001
IP address: default IP address:**192.168.100.220** or **192.168.100.221**

After factory reset the IP address is always: 192.168.100.221

3.screen
Temperature: Temperature inside the laser head.
TT°C

4.screen
AT mode: Manual / Auto
SPWR:0-10 AGC:0-1G:0-9
SPWR: (1-9=ok): Important that these signal power has no any connection to the receiving level. 0 - too little light. 10: too much light. 1-9: Tracking is working, but the optimum range is:3-8.

5.screen
SGM pos.: Pos,Pos
AFMode: auto or manual
Signal position: [0-100], [0-100] tracking signal position. X and Y position (in %), so the system seeks 50 and 50 %.
**Beam searching** method: Beam-Search Algorithm: Try to find the laser beam if a big and sudden movement have occurred which falls out of tracking field of view. Useful to use on such installation sites where many movement of laser head can happen. Possible levels: Disabled, Short, Long.

6.screen
Email address

7.3 UserInterface

This field halp you direct the Auto Tracking system and the Focus set system.

When you change the status here you can see a signal that the chang was successful.

Here you can change different status.

Here you see different positions of recieved laser beam and also you can see different Auto Tracking and Auto Focus feedback (this is only a display, not a button).

LCD screen

With these buttons you can adjust the AutoFocus and the Auto Tracking systems manualy.

Use this button to change LCD screen.

In Auto Tracking made, by pressing this button the Auuto focus mode will turn ON or turn OFF (the 4 leads above it will blink twice).

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Factory reset/First boot: After turning ON the status LED on the laser head will flash for about 30 seconds then the laser head will change to Auto Tracking (AT) status, after that the LED will be continuously yellow.
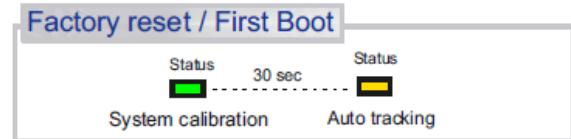
Tracking enabled (status LED: yellow): If the status LED is yellow then the AT system is enabled.
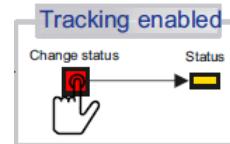
Manual set Mode (status LED: green): After booting the equipment will automatically turn to AT mode. You can change to manual mode by pressing the Change Status button and in this case the LED will be green. Here you can direct the AT system by pressing the up-down and left-right buttons.
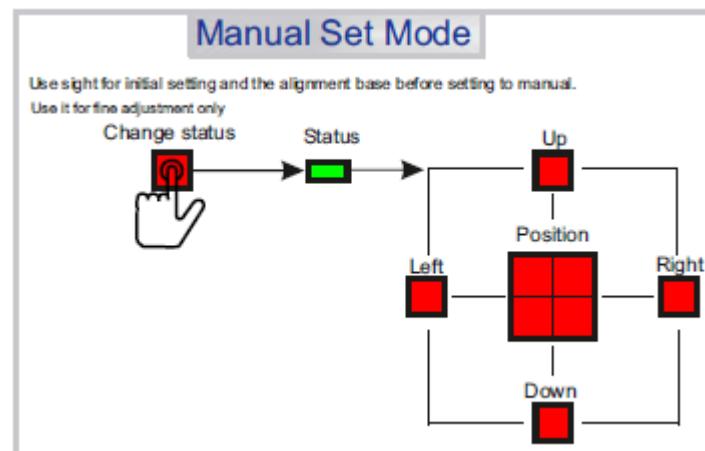
Manual coarse alignment setting(status LED: green): By pressing the right-left buttons both at the same time then the AT system stops in the middle position, the Position LEDs will turn twice confirming that. After that you can start the alignment using the alignment unit.
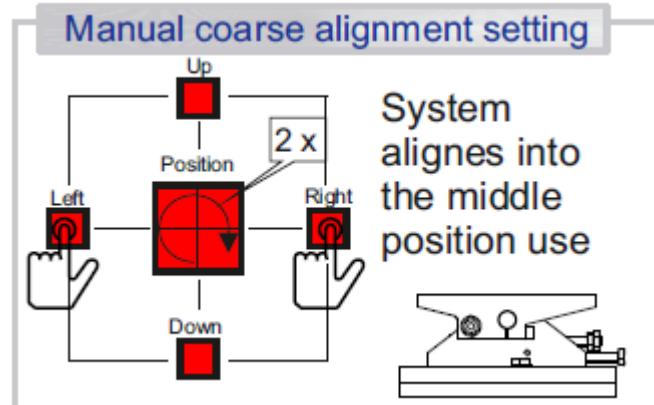
Last know position (status LED: green): Pressing the upper and left buttons both at the same time moves the laser head to the last known working position. The Position LEDs will turn 3 times confirming that.
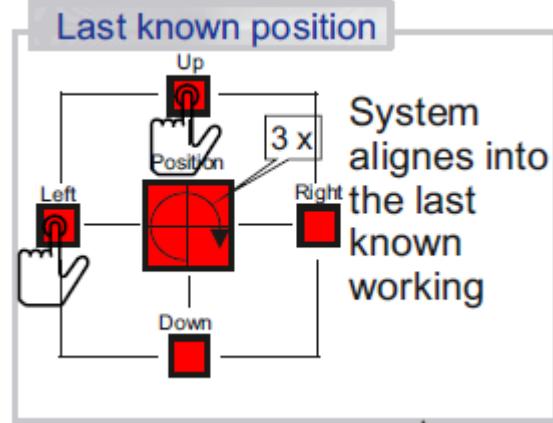
Focus set mode: (status LED: dark): By pressing the Change Status button for 3 seconds the Status Led will turn OFF (dark), after that the laser head will turn to focus mode. You can change the size of the laser beam by pressing the buttons as in below sketch.

Focus Set Mode
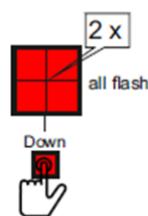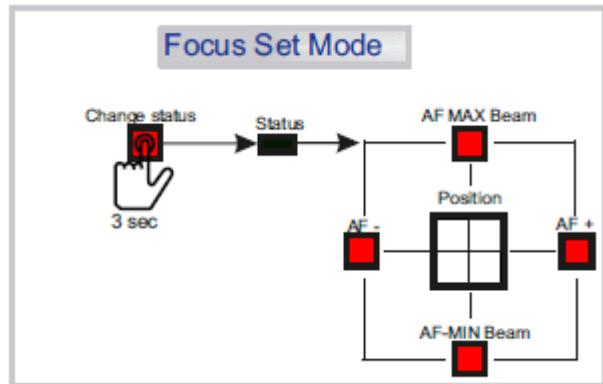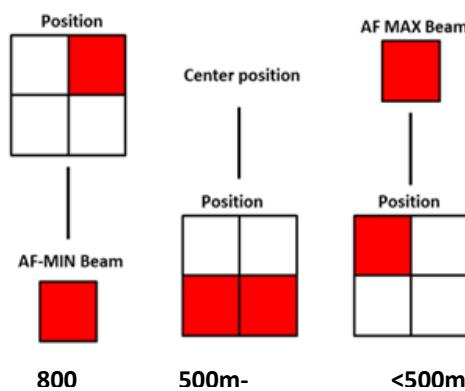
In Auto Tracking made, by pressing this button the Auto focus mode will turn ON or turn OFF (the 4 leads above it will blink twice).

7.4 System layout with GEO20

Beside the GeoDesy laser equipment (buckup) you can only use GeoDesy's GEO20 Radio equipment. In the case of using a different backup solution, could cause undesired operation. Please referr to support@geodesy-fso.com for more inforamation about the compatibility.

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Fax.: 06-1-481-2049
E-mail: info@geodesy.hu
http://www.geodesy.hu
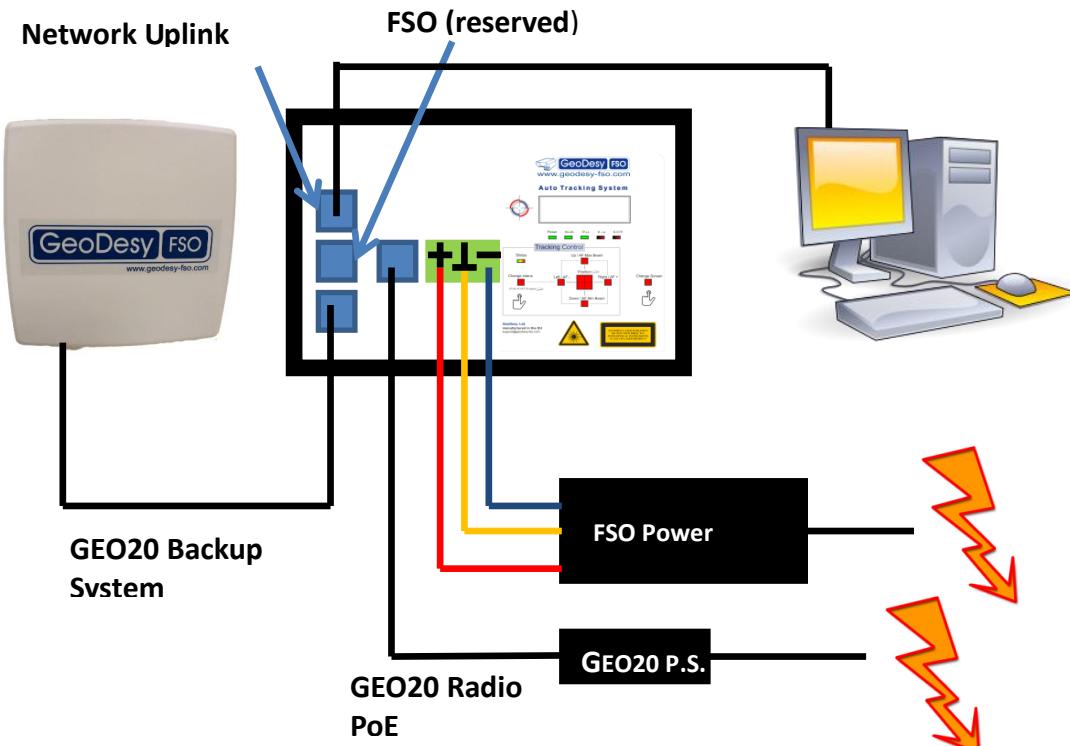
7.4.1 Connecting to your Network

1. Orange/White   TX+
2. Orange   TX
3. Green/White   RX+
4. Blue   +VIN
5. Blue/White   +VIN
6. Green   RX-
7. Brown/White   -VIN
8. Brown   -VIN

You can upgrade the system.   You can upgrade the Network Interface.

Tracking   Network Interface
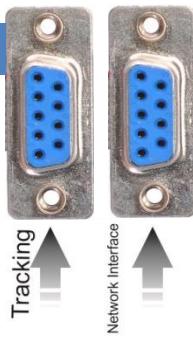
Connection Board
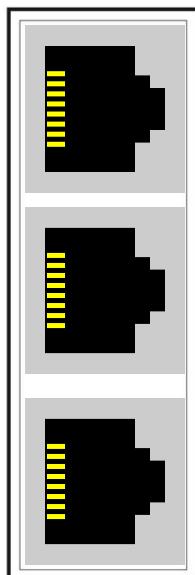
Network Uplink

GEO20 Power   Fuse T2A

FSO
reserved   Power Input 48Vdc

Backup System   +   N/C   -

24
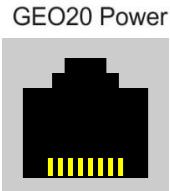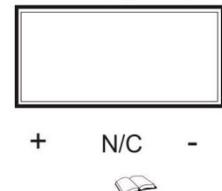
8 The mounting bracket

8.1 How to use the alignment unit

1 step
The fixing screws and the fine fixing scews should be loose.Pllease see a pictures No1.
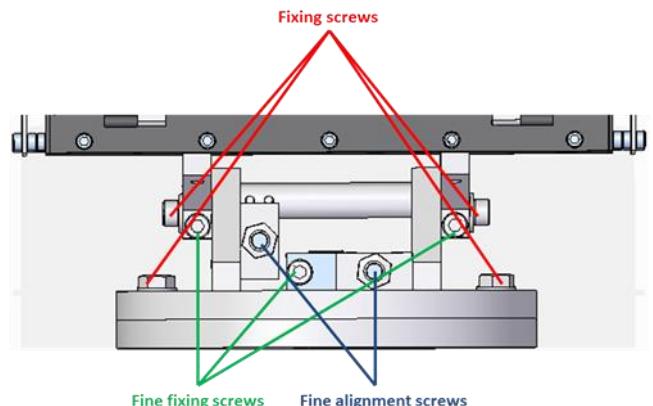
2 step
Untighten the 2 screws seen an pictures   No2.
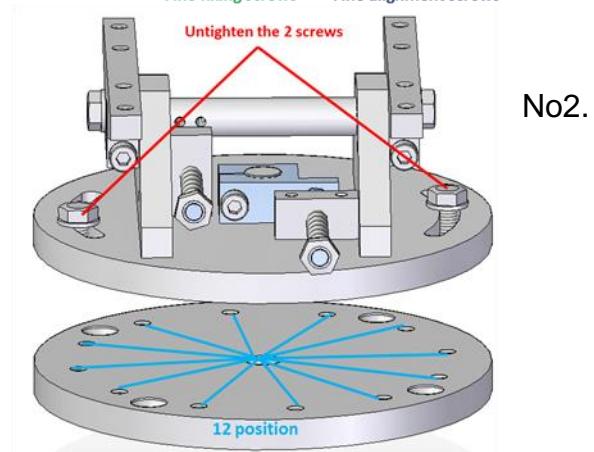
3 step
Align the laser head horizontally using 2 of the 12 available positions.(Positions are an 30° scale)
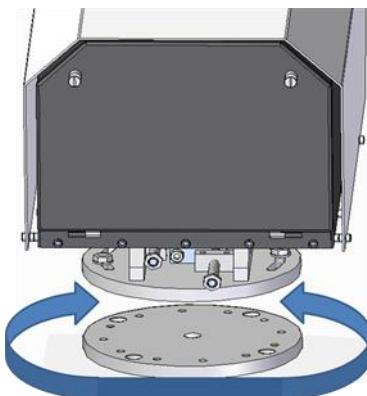
4 step
Align the laser head vertically.

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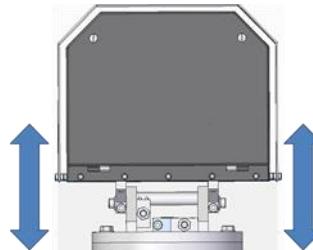
5 step
Tighten the screwsseen a picture No5.

Tighten fine fixing screws
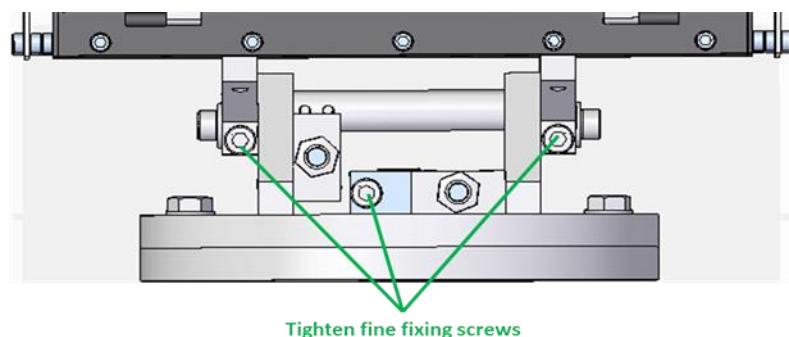
6 step
Align the laser head to best position using the fine alignment screws. Please see Picture No6 how to direct these screws.
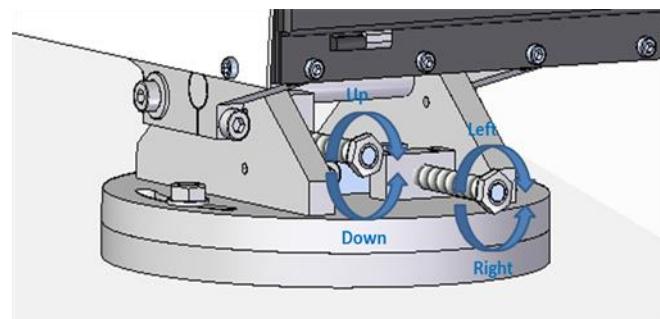
7 step
Tighten the fixing screws as an picture No7.

Tighten the fixing screws
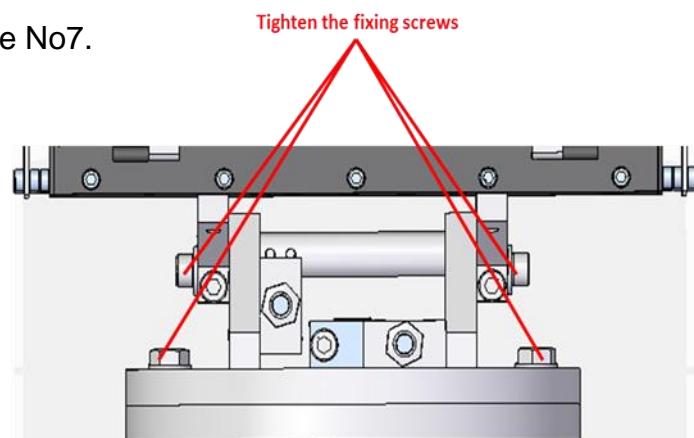
8.2 Alignment of the heads

Turn ON the equipment.

Turn the equipment to Manual Set Mode(status LED:green).(see **7.3 UserInterface**)

By pressing the right-left buttons both at the same time then the AT system stops in the middle position, the Position LEDs will turn twice confirming that. After that you can start the alignment using the alignment unit.

Using the telescope and alingment unit.

Target Side B with the crosshair bulit in to the head on Side A.

Move to best receiving level using the screws of the alignment unit.(see **8.1 How to use the alignment unit**). The good alignment is when all 4 position LEDs are ON and you have reciving level. If you have this at both sides then you have almost ended the installation.

Please enable the Auto Tracking system. (status LED:yellow)

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9 Management

9.1 Features

The **Inband** network-monitoring unit is a newly developed highly featured monitoring for GeoDesy FSO manufactured laser links. This high quality equipment allows the user to monitor the link statuses such as detector voltage transmitter status, and many other features of the Laser link. Nevertheless, this chapter is intended to describe the usage of this network monitoring, and its connection and relationship with the GeoDesy FSO laserheads.

The Monitoring system is a standard feature in the system. For laser head it is an optional and has to be activated. After the activation was purchased, with the invoice number, and the device serial number contact GeoDesy FSO technical support, for activation code. For further information check Activation chapter.

Inband monitoring is providing information about

9.1.1 Login Screen and password

The laser heads IP address is:**192.168.100.220** or **192.168.100.221**.The GeoDesy FSO unit arrives with preset values. Such as user name and password. We strongly recommend you to change the password after the unit was installed. The default username is admin, and the password is admin. If you forget your password contact technical support to receive your fail-safe password.

9.1.2 Head information screen

The head information screen is the main navigation panel through this screen you will be able to navigate into the submenu, of the monitoring system.

Device Name: displays the name of the device. Individually can be changed

System Uptime: Diplays the lapsed time from the last boot of the device

IP address: Displays the IP(Internet Protocol) address of the device which must be a unique identifier in the

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network.

Managed head: displays the managed head type.

Head Serial Number: This is the head serial number and during the Activation process we will ask for this number.

9.1.3 Status info screen

Clicking on the Device Setup you will enter the main status information screen, which will give you good summarized information of the device, such as status information of the transmitters, detector level, or temperature values.

Laser ON: Transmitter transmitts

Laser OK: Transmitter works properly, transmitts and the transmitted signal is valid.

Temperature: ambient temperature inside the device. These units were designed for extreme conditions and should not have any problems under -60C to +80C. In fact the unit is emitting some heat so the temperature displayed is not the air temperature outside the head. For example the temperature can be -10C outside but in the device it wont go below -1 or -2. The value will display error depeding on the setting was done device setup. There is no default value for this setting, only a suggested value, which is 60C.

Detector level: shows the local heads received level. In volts, the maximum is 7 volts and the minimum is 0.2 volts. The value will display error depeding on the setting was done device setup.

Remote Detector level: this value is dispalyed form reception of the remote head. The maximum is 7 volts and the minimum is 0.2 volts.

TP_Link: displays that there is connection over the TP cable.

FSO Link: displays that there is valid signal received from the remote end.

Remote is visible: this status information is a good information about the connection over the two laserheads if this status is OK that means that there is data transferred over the link.

Remote TP Link: shows that whether the remote end is connected into the switch and the TP interface is available.

PSU: The PSU of the device is sending the OK signal.

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RX OK: this information is showing that the receiver is enabled. It basically means that there is valid signal with necessary strenght is received in the local end.

9.1.4 Device setup

The device setup screen leads you to the main monitoring options. Here the alarms can be set and main information about the Laser head.

BitView Web
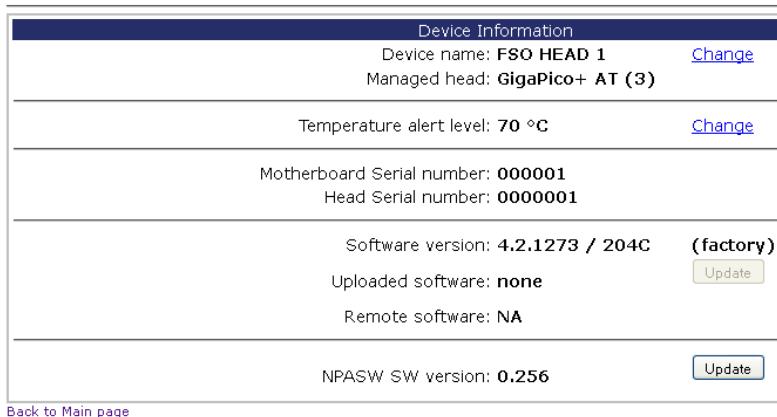
Device Information		
Device name: **FSO HEAD 1**		Change
Managed head: **GigaPico+ AT (3)**		
Temperature alert level: **70 °C**		Change
Motherboard Serial number: **000001**		
Head Serial number: **0000001**		
Software version: **4.2.1273 / 204C**		(factory)
Uploaded software: **none**		Update
Remote software: **NA**		
NPASW SW version: **0.256**		Update

Back to Main page

Device name: uniqe identifier of the device

LB-WEB
set value:
Set
Close

Managed head: Type of the laserhead

Temperature alert level: when the temperature reach this value, the alarm will be triggered.

Motherboard Firmware version: This is the version number of the Firmware

File image version: Version number of the file image

Motherboard Serial number: Mainboard serial number inside the head (Not the same as the Head Serial Number)

Head Serial number: Serial number of the unit. Should be the same number as the one on the back of the unit. If the number is missing or not match up with the one on the back, during activation this is the number you will have to let the support know.

Software version:this head software version.

Uploaded software:

Remote software:the other side software version.

NPASW SW version: Network Port Auto SWitchover version.

0.256: HW failure or such system which has no yet switches panel.

0.512:being updated

1:SW version.

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9.1.5 Network Setup

Clicking on the Network Setup link you can have access to the Ethernet module of the system, this will make easy access to the IP number and/or port settings. These settings are sensitive setting and some of them cannot be restored by the user. Please always do the changes with extra care! If you have doubt in any step, do not hesitate to contact the technical support of the manufacturer website for further information.

Network Setup		
IP address: **192.168.100.221**	Change
Subnet mask: **255.255.255. 0**	Change
Default gateway: **192.168.100. 1**	Change
Mac address: **00-50-C2-19-30-05**	
Auto MDI/MDI-X: **enabled**	Change
Auto-Discovery: **enabled**	Change
Auto-Discovery UDP port: **2690**	Change
Remote IP address: **192.168.100.220**	Change SWAP
NPASW (Network Port Auto-Switchover) mode: **FSO**	Change
Actual NPASW port: **FSO**	
NPASW time limit: **2 seconds**	Change
NPASW threshold LOW: **0.50 V**	Change
NPASW threshold HIGH: **1.00 V**	Change
Status summary		
Detector level: **0.00 V**	
Remote Detector level: **0.00 V**	
Remote is visible: **error**	

Back to Main page

Local IP: the IP address of the local device can be set in this box. If the IP address is set retype it to your browser. Enter only valid IP addresses, if you forget the IP address, you will have to turn to our support and in some cases return the device for reseting the IP address. Please always do the IP change with care.

Subnet mask: you can set the subnet mask of the local device.

Default gateway: The default getway setting for the local device.

Remote IP:This will tell this device what the IP address of the remote device is. This setting wont change the remote units IP address, this just identify the remote device for the local device. If the IP address is not valid all diplays will go error and the display of the remote sites received level on the laserhead will be disabled!

Auto MDI/MDI-X: this enables the Auto setting for the

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MDI/MDI-X, some old switch types might report incompatibility here it can be switched off. (Auto MDI/MDI-X can be turned off even in the Xs systems)

NPASW mode: Network Port Auto SWitchover

FSO: Transmition throgh FSO.

Backup: Backup channel (FSO disabled)

Auto: If NPASW mode is Auto then the actual channel chosen by the software is ON.(FSO or backup)

NPASW time limit: Minimum time needed to switch from back up to FSO(minimum 2 seconds)

NPASW treshold LOW:switches to backup

NPASW treshold HIGH:switches to FSO

9.1.6 SNMP Setup

One of the main features of the device is the SNMP(Simple Network Monitoring Protocol). The SNMP settings can be set on this page.

Trap address: The IP address of the SNMP trap over the network.

Trap events in the system you have possibility to setup three different trap event.

For further details on the trap event see Trap event list chapter of this book. In this section there are the settings of the SNMP Agent.

SNMP trap address: IP address of the SNMP tarp computer

Read Community and Read Write community To the setup of the Read and the Read-Write community, the preset value is public

Agent UDP Port the SNMP agent UDP port number (1…1000) the preset value is 162

Trap UDP Port: the SNMP trap UDP port number (1…1000) the preset value is 161

Traps:

The Laserhead is sending two different traps:

LaserHeadAlarm (OID: 1.3.6.1.4.1.17857.0.1201) This trap will be sent after any of the alarms will go on (for alarm setting please see chapter 5.4)
LaserHeadAlarmCancel (OID: 1.3.6.1.4.1.17857.0.1202) After the alarm goes off this trap will be sent

9.1.7 Auto tracking setup

Tr-SW version: The Auto Tracking software version number.

Mode:
Automatic : normal tracking mode. Userinterface: orange LED.

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Manual (auto tracking off): you can manually move the laser head using the userinterface or the management (will refer to that on next page). Userinterface: green LED.

Signal power(1-9=ok): Important that these signal power has no any connection to the receiving level. 0 - too little light. 10: too much light. 1-9: Tracking is working, but the optimum range is:3-8.

Signal position: [0-100], [0-100] tracking signal position. X and Y position (in %), so the system seeks 50 and 50 %.

Detector level: shows the local heads received level. In volts, the maximum is 7 volts and the minimum is 0.2 volts. The value will display error depeding on the setting was done device setup.

Remote is visible: this status information is a good information about the connection over the two laserheads if this status is OK that means that there is data transferred over the link.

AGC: Automatic GAIN Control. Tries to keep level of GAIN. Useful to use at big distances and when visibility often and many times changes (fog, etc.).AGC:0 or 1

Gain: Actual strengthening of tracking signal (Currently maximum 9) which should be increase at small detector level.

Beam searching method: Beam-Search Algorithm: Try to find the laser beam if a big and sudden movement have occurred which falls out of tracking field of view. Useful to use on such installation sites where many movement of laser head can happen. Possible levels: Disabled, Short, Long.

Beam searching activity: Beam searching actual status. Possible values: idle, LastGood(a/b), LG-X(a/b), LG-CIRCLE(a/b), LG-CIRCLE2(a/b), Center, C-CIRCLE(a/b) where „a" is the actual status of level part, „b" number of level parts.

Last good motor position: Saving against turning Off (blackout) happens daily.
Motor position: positions of tracking motors.

Auto Focus adjustment (auto tracking off): this mode can't be turned ON on the web only on the useriterface. If you have turned on the Auto Focus then you will be able to adjust the laser beam size. Userinteface: LED is dark (no color).

| STEP X -5 | STEP X -1 | STEP X +1 | STEP X +5 | STEP X by ... |
| STEP Y -5 | STEP Y -1 | STEP Y +1 | STEP Y +5 | STEP Y by ... |

Here you can adjust the Auto Tracking manually.
STEP (X;Y) by…: The tracking would go to the value written here.

Auto-Focus system: Here you can adjust the size of the laser beam. In order to reach the above Auto Focus system you will have to adjust the MODE button at the Userinterface.
In Auto tracking mode, by pressing the down botton the Auto Focus mode will turn ON or turn OFF (the 4 leads above it will blink twice).

After setting the Manual Focus controls you can adjust the manual focus by clicking on the „OPEN or CLOSE" buttons.

Diagnostic Code: Should be only zeros (00000). If not zeros then there is an error, in this case please restart the laser head. If after restart you still do not get the only zeros (0000) then please contact our Support team by sending an e-mail to: support@geodesy-fso.com .

9.1.8 Security

On the security section you can set the username and the password for the unit. If you have forget the usernam and/or the password please contact The technical support.

MGM Trusted-host filtering: Here you can adjust two adresses where you can till in from which computer with you reach teh MGM! To adjust you will hove to adjust a filter.
Filter adjust:
Off:Turned off.
IP:Only see the IP address.
MAC: Only see the MAC address.
IP+MAC:Either IP or MAC address should be equal to the adjusted.
IP&MAC:Both IP and MAC addresses should be equal the adjusted.

9.2 Tracking software update

1. Connect the RS232 cable between the laser head and the PC.

2. Press and keep pressing the right button of the User Interface while you restart the laser head. The laser head will turn to upgrade mode and you can see the status LED blinking yellow.

3. Start the Total Commander program and start PIC32.exe program.

4. Choose COM1 port.

5. Click ont the Connect button.
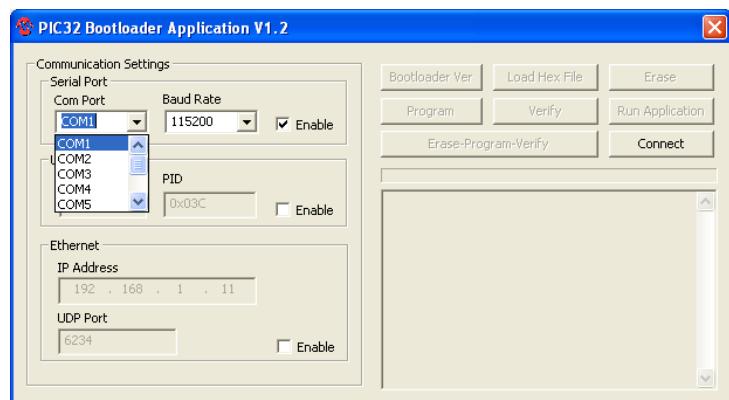
6. Click on Erase button.
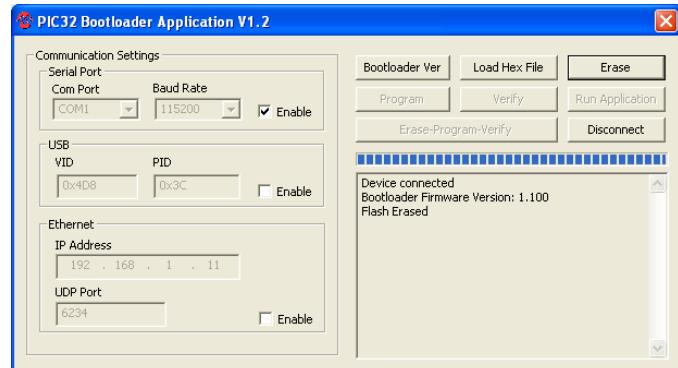
7. Click on Load Hex File button and then choose the attached .HEX file (new software)

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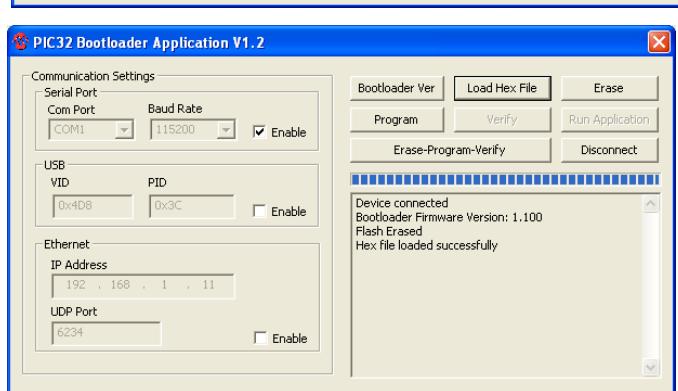
8.Click on the Program button.
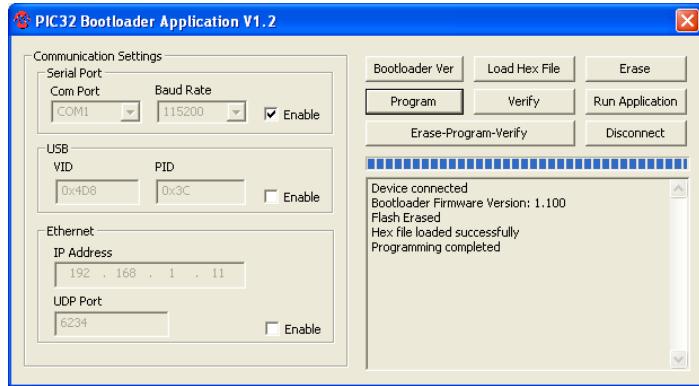
9.Click on Run application button: the laser head will restart with the new software.

10. Click on the Disconnect button and close the program.

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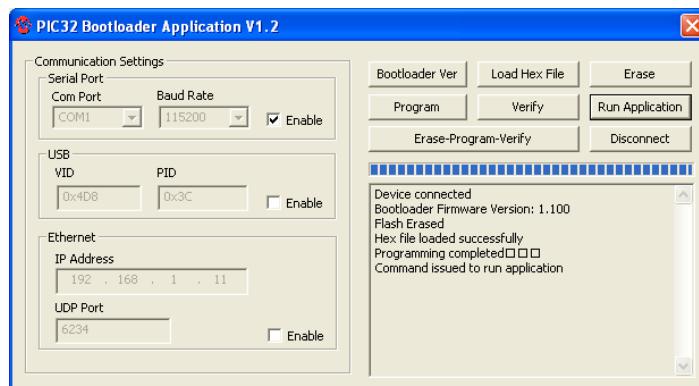
9.3 Network Interface software update

1. Connect the RS232 cable between the laser head and the PC.(Network Interface RS232)

2. Enter into the management of the laser head and into the device info.

3.Click on the „Update" button.

4.Click on OK button.

5. Start the Total Commander program and start PIC32.exe program.

6. Choose COM1 port.

7.Click ont the Connect button.

8.Click on Erase button.

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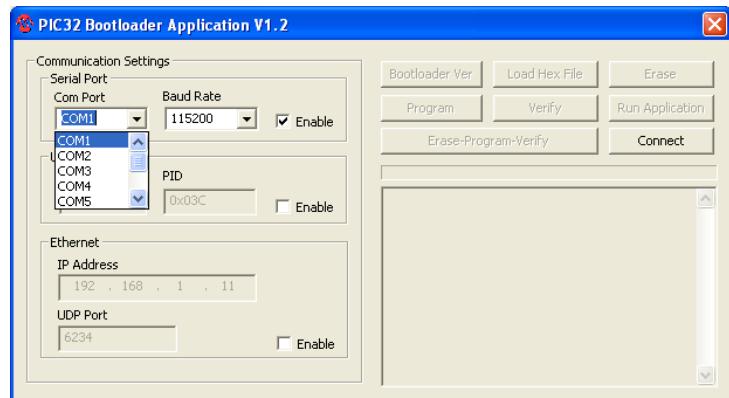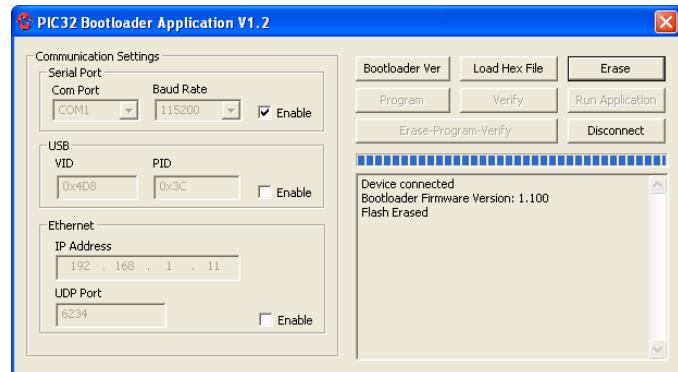
9. Click on Load Hex File button and then choose the attached .HEX file (new software)
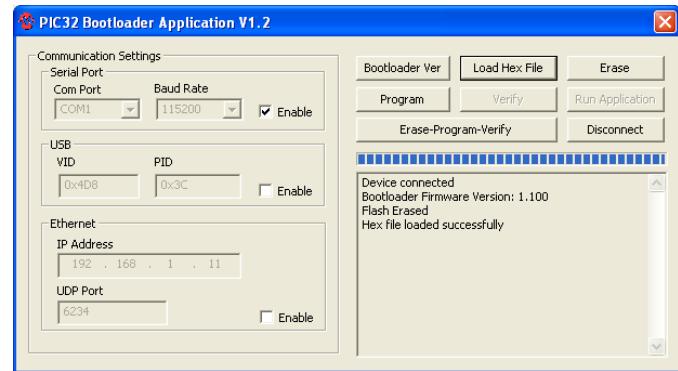
10. Click on the Program button.
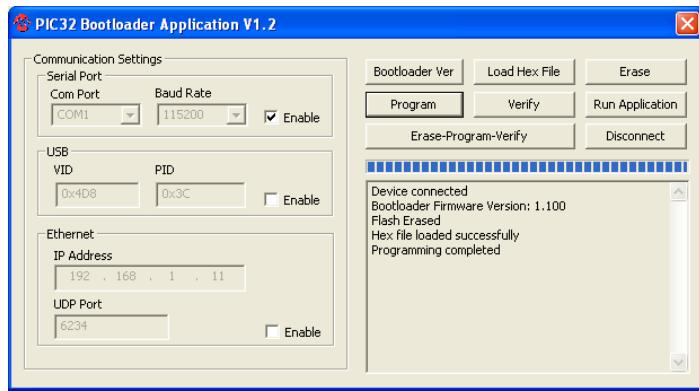
11. Click on Run application button: the laser head will restart with the new software.
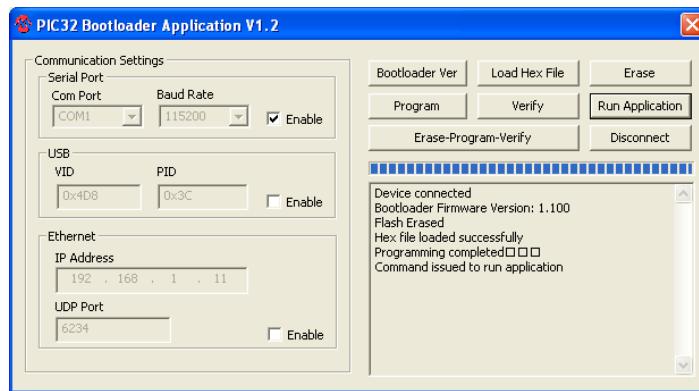
12. Click on the Disconnect button and close the program.

9.4 Mandatory Management Activation

Thank you for buying our product. Please read this note carefully. From software version (3.2.1218/R090x)!

The product you have bought has fully functional management software, which has limitation only in time. The unit activation request should be sent to activation@geodesy-fso.com. And the activation code will be issued, later and sent to the email address give, or can be accessed from your local distributor.

**After 90 days if the system was not activated the data transmission will be degraded!**

Activation process:

1. Login to the devices through a web browser using the IP:192.168.100.220,192.168.100.221

2. Default login name:admin and password:admin

3. Click on Evaluation period

4. Click on Get a key

5. Fill in the table and click on send

6. We will return the activation key

Limitations:

- All Next-Series(100MB/s) limitation course 1-60 days unlimited, for 61-80 days 10MB/s, for 81-90 days 1MB/s, beyond 90 days 100KB/s (MGM-Option).

- All GigaNext-Series(1000 MB/s) will be limited after the 90th day, when the whole bandwidth will be blocked, except the management system.

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9.5 Reloading factory default settings

Should you need to reload the original factory settings follow the steps below.
1. turn ON the switch of Power Adapter
2. wait 3 seconds
3. then turn OFF the switch of the Power Adapter
4. above procedure 3 times.
5. plug turn ON the Power Adapter an leave it turned ON

After this the system resets the following information to the factory default.

- IP address
- Username
- Password
- Device name
- SNMP settings
- Alerts
- Auto MDI/MDIX
- NPASD (if avialable):if the reciver does not detect sufficient light power, then in the head would switch off the network connection signal. Note: During this perid the 100MB/s laser heads MGM will not be available.

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